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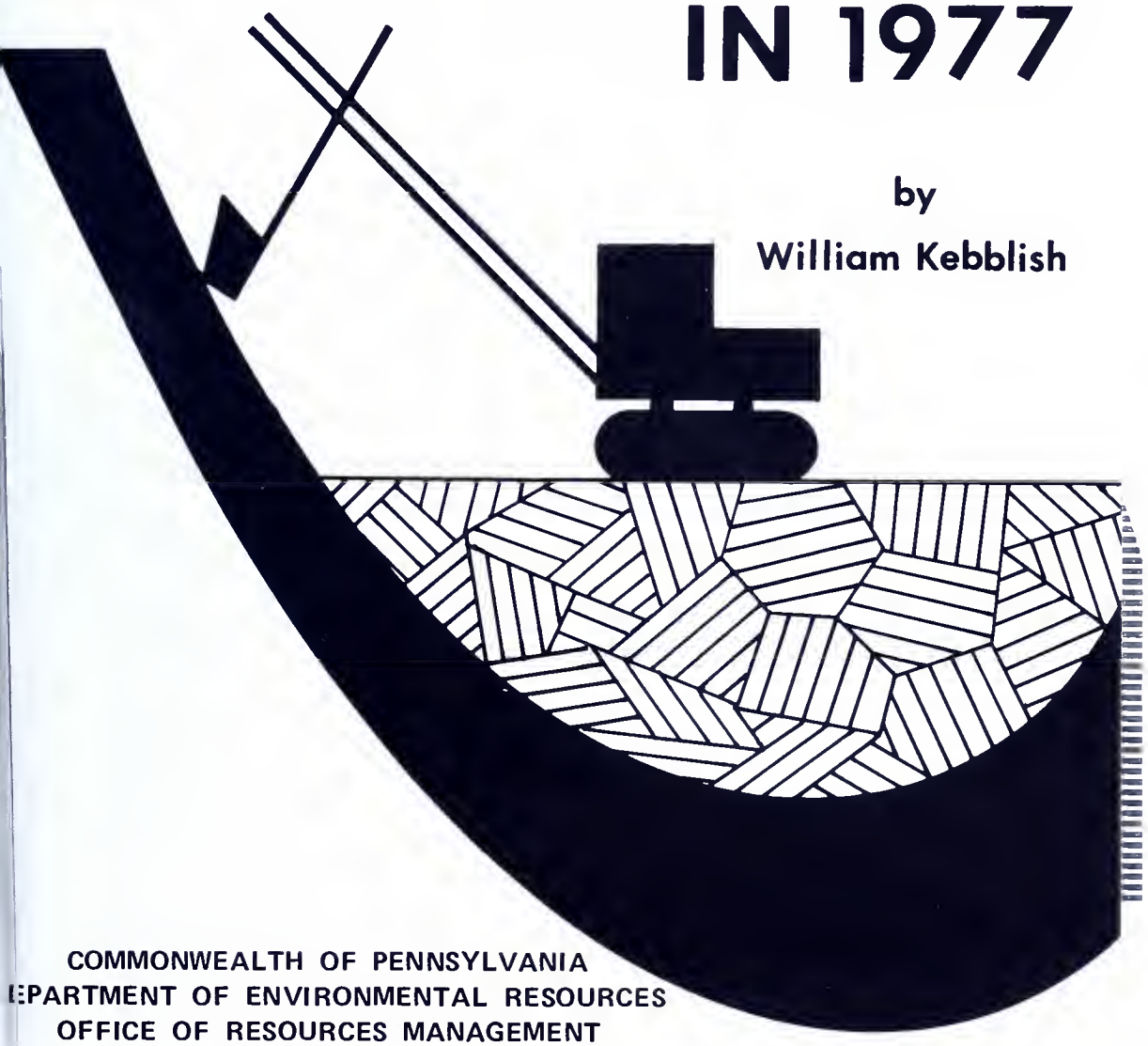
THE MINERAL INDUSTRY OF PENNSYLVANIA IN 1977

by
William Kebblish



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

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UNITED STATES DEPARTMENT OF THE INTERIOR • James G. Watt, Secretary

BUREAU OF MINES

This publicotion is o chapter from the current Bureou of Mines Minerols Yeorbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The seporote volumes of the Yeorbook ore sold by the Superintendent of Documents, Woshington, D.C. 20402.

The Mineral Industry of Pennsylvania

This chapter has been prepared by the Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources (DER), under an agreement for collecting information covering mineral production from mines and quarries.

By William Kebblish[1]

Pennsylvania mineral production reached a record output value of $3,044 million, an increase of about $7 million above that of 1976, but $57 million less based on 1967 constant dollars. Compared with that of 1976, increases in value were attained by masonry and portland cement, lime, natural gas, petroleum, and stone. Decreases in value occurred in clays, sand and gravel, and zinc.

Table 1.—Mineral production in Pennsylvania[1]

Mineral	1976		1977	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:				
Masonry thousand short tons	379	$16,903	411	$19,927
Portland do	5,989	185,170	6,162	196,443
Clays[2] do	2,291	16,037	2,304	13,075
Coal:				
Anthracite do	6,228	209,234	5,861	205,138
Bituminous do	85,777	2,173,009	84,639	2,166,685
Gem stones	NA	9	NA	10
Lime thousand short tons	2,069	68,356	2,007	72,591
Mica (scrap) do	W	W	1	W
Natural gas million cubic feet	89,386	61,229	91,717	73,374
Peat thousand short tons	W	W	16	353
Petroleum (crude) thousand 42-gallon barrels	3,019	36,700	2,715	38,810
Sand and gravel thousand short tons	19,038	55,611	18,846	52,578
Stone:				
Crushed do	63,542	161,250	63,522	163,652
Dimension do	65	4,639	66	5,362
Zinc (recoverable content of ores, etc.) short tons	22,280	16,487	22,825	15,703
Combined value of clays (kaolin), copper, iron ore, natural gas liquids, tripoli, and items indicated by symbol W	XX	r32,716	XX	20,263
Total	XX	r3,037,350	XX	3,043,964
Total 1967 constant dollars	XX	1,559,072	XX	p1,502,501

pPreliminary rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included in "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes kaolin; value included in "Combined value" figure.

Table 2.—Value of mineral production in Pennsylvania, by county[1 2]

(Thousands)

County	1976	1977	Minerals produced in 1977 in order of value
Adams	W	W	Stone, lime, clays, mica.
Allegheny	$134,474	$25,455	Cement, stone, clays, sand and gravel.
Armstrong	W	9,667	Sand and gravel, stone, clays.
Beaver	W	W	Sand and gravel, clays.
Bedford	W	2,334	Stone, sand and gravel.
Berks	59,430	47,702	Cement, iron ore, stone, sand and gravel, copper, clays.
Blair	W	W	Stone, sand and gravel.
Bradford	W	W	Sand and gravel, stone.
Bucks	W	W	Stone, sand and gravel, clays.
Butler	57,039	26,089	Lime, cement, stone, clays, sand and gravel.
Cambria	284,363	W	Stone.
Cameron	W	W	Sand and gravel.
Carbon	W	W	Sand and gravel, stone.
Centre	W	W	Lime, stone, clays.
Chester	W	W	Stone, lime, clays.
Clarion	W	W	Stone.
Clearfield	181,484	W	Clays, stone, sand and gravel.
Clinton	W	W	Stone, clays, sand and gravel.
Columbia	W	W	Stone, sand and gravel
Crawford	W	1,549	Sand and gravel.
Cumberland	W	4,544	Stone, sand and gravel, clays.
Dauphin	W	W	Stone, sand and gravel.
Delaware	W	W	Stone.
Elk	W	W	Do.
Erie	W	4,591	Sand and gravel, peat.
Fayette	67,959	W	Stone, clays.
Forest	W	W	Sand and gravel, stone.
Franklin	W	W	Stone, sand and gravel.
Fulton	W	W	Do.
Greene	W		
Huntingdon	8,902	W	Sand and gravel, stone.
Indiana	W	W	Stone.
Jefferson	48,996	W	Clays, stone.
Juniata	193		
Lackawanna	10,869	W	Stone, sand and gravel, peat.
Lancaster	W	W	Stone, clays, sand and gravel
Lawrence	W	W	Cement, stone, sand and gravel, clays, peat.
Lebanon	W	W	Lime, stone.
Lehigh	W	W	Cement, zinc, stone.
Luzerne	W	5,041	Stone, sand and gravel, peat.
Lycoming	10,269	W	Sand and gravel.
McKean	W	W	Stone, clays.
Mercer	W	W	Sand and gravel, stone.
Mifflin	W	W	Stone, sand and gravel, lime.
Monroe	W	W	Stone, sand and gravel, clays, peat.
Montgomery	W	W	Stone, lime, cement, clays.
Montour	W	W	Stone.
Northampton	W	W	Cement, stone, sand and gravel.
Northumberland	W	W	Stone, sand and gravel, clays, tripoli.
Perry	W	W	Stone.
Pike	W	W	Stone, sand and gravel, peat.
Potter	W	36	Stone.
Schuylkill	105,872	1,192	Stone, sand and gravel.
Snyder	W	W	Stone.
Somerset	W	W	Stone, clays, sand and gravel.
Sullivan	1,560		
Susquehanna	W	1,122	Stone.
Tioga	W	1,468	Stone, sand and gravel.
Union	W	W	Stone, clays.
Venango	23,133	1,137	Sand and gravel.
Warren	6,758	1,365	Do.
Washington	W		
Wayne	W	2,010	Stone, sand and gravel.
Westmoreland	W	W	Do.
Wyoming	W	W	Sand and gravel.
York	43,327	47,632	Cement, stone, lime, sand and gravel, clays.
Undistributed[3]	r1,992,723	2,861,031	
Total[4]	r3,037,350	3,043,964	

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Undistributed."

[1]Philadelphia County is not listed because no production was reported

[2]Value of petroleum is based on an average price per barrel for the State.

[3]Includes some natural gas liquids that cannot be assigned to specific counties, natural gas, petroleum, coal, gem stones, and values indicated by symbol W.

[4]Data may not add to totals shown because of independent rounding.

Table 3.—Indicators of Pennsylvania business activity

		1976	1977[p]	Change, percent
Employment and labor force, annual average:				
Total civilian labor force	thousands	5,094.0	5,168.0	+1.5
Unemployment	do	404.0	398.0	-1.5
Employment (nonagricultural):				
Mining	do	48.3	47.2	-2.3
Manufacturing	do	1,335.2	1,341.6	+.5
Contract construction	do	180.3	181.1	+.4
Transportation and public utilities	do	256.5	258.7	+.9
Wholesale and retail trade	do	919.3	925.7	+.7
Finance, insurance, real estate	do	211.4	217.3	+2.8
Services	do	839.7	864.3	+2.9
Government	do	721.6	714.3	-1.0
Total nonagricultural employment	do	4,512.3	4,550.2	+.8
Personal income:				
Total	millions	$75,562	$82,630	+9.4
Per capita		$6,402	$7,011	+9.5
Construction activity:				
Number of private and public residential units authorized		42,111	50,298	+19.4
Value of nonresidential construction	millions	$564.4	$464.4	-17.7
Value of State road contract awards	do	$199.0	$150.0	-24.6
Shipments of portland and masonry cement to and within the State	thousand short tons	3,024	3,126	+3.4
Mineral production value:				
Total crude mineral value	millions	[r]$3,037.4	$3,044.0	+.2
Value per capita, resident population		$256	$258	+.8
Value per square mile		$67,085	$67,147	+.1

[p]Preliminary. [r]Revised.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

Leading producing counties, with primary commodities in parentheses, were Northampton and Lawrence (cement), Clearfield (clays), Centre (lime), Montgomery, Lancaster, Bucks, Northampton, and Chester Counties (stone).

Pennsylvania led the Nation in smelter production of cadmium, was second in production of crushed stone, and seventh in dimension stone and zinc production.

Legislation and Government Programs.—Legislation approved by the Pennsylvania General Assembly and signed by the Governor on July 25 guarantees landowners that water supplies will not be contaminated or diminished by surface coal mining operations without replacement. Any mine operator affecting a water supply by contamination or diminution shall restore or replace the affected supply with an alternate source of water adequate in quantity and quality for the purposes served by the supply.

The Department of Environmental Resources' (DER) bonding schedule effective February 25, 1977, applies to all coal and noncoal surface mine operations, with the exception of noncoal quarry-type pits where blasting and sloping is necessary to carry out the approved reclamation plan. A bonding schedule for noncoal quarry-type pits is presently being drafted.

DER's amendments to Pennsylvania Code Chapters 121, 123, 124, 127, 129, and 139 became effective August 28, 1977. Amendments pertain to general provisions, standards for contaminants, emission standards for hazardous air pollutants, construction, modification, reactivation, and operation of sources standards for sources and to sampling and testing. The purpose of these amendments are to establish a program for regulating air pollution discharges from coke ovens, to define the term stockpiling, to establish a clear mechanism for evaluating minor fugitive emissions and providing written approval of such emissions, to provide a standard for vinyl chloride, to clarify meaning of section 121.8, and to inform the agriculture industry that DER should not regulate air contaminants from production of agricultural commodities in their unmanufactured state.

Chapter 95 of DER's regulations relating to waste water treatment requirements was proposed and approved during 1977. Waste water treatment will require a minimum of secondary treatment for all wastes.

DER's Chapter 97 deleting discharge requirements for phenols and cyanides, modifying discharge limits for oil-bearing waste waters, and establishing special oil discharge requirements based upon technology installation for petroleum marketing terminals became effective July 24, 1977.

A February 18, 1977, decision by the Pennsylvania Supreme Court required Barnes & Tucker Co. operating in Cambria and Indiana Counties, to treat acid mine drainage discharges from the company's

abandoned Lancashire No. 15 mine and to reimburse the Commonwealth for expenses incurred in treatment of mine discharges during court litigations. Lancashire No. 15 mine was closed in 1969 and the Commonwealth had been treating the acid mine discharge to protect the waters in the Susquehanna River since August 1970. In September 1977, Barnes & Tucker filed a brief with the U.S. Supreme Court to reverse the Pennsylvania Supreme Court decision on grounds of a former Pennsylvania State law allowing companies in 1965 to choose between treating mine drainage or closing and sealing the mine.

A pending case before the Greene County Court filed late in 1977 concerned ownership of methane in coal seams. The official opinion, Number 53, of the Pennsylvania Attorney General dated October 31, 1974, stated that those persons who own or have obtained the right to extract gas have the right to assert legal title thereto. This opinion was supported by Mary Cunningham, the plaintiff, but challenged by United States Steel Corp., the defendant.

In early March, Governor Shapp lifted an 8-year ban on offshore drilling for natural gas in Lake Erie and ordered DER to prepare offshore leases for sections of the 430,000 areas under Pennsylvania's jurisdiction.

Environment.—The Environmental Quality Board proposed policies for critical environmental areas for the Commonwealth's Environmental Master Plan which were published in the Pennsylvania Bulletin on January 22, 1977. The policies are not rules or regulations but do provide the foundation for environmentally sensitive growth and development. They also identify environmental concerns which must be studied and considered in the decision-making process. Nine critical areas of concern in the Plan are for prime farmlands, watersheds with high-quality streams, flood plains, coal resources, areas with limited water supply, clean air resource areas, open space in metropolitan areas, geologic areas with development restraints, and areas with carbonate geology.

Detailed land-use maps of the entire Commonwealth were completed in early 1977 by United States Geological Survey under an agreement with DER. The Land Use Data Analysis utilizes high-altitude plane photo imagery to delineate as many as 37 separate land-use categories. A total of 98 maps, 7 for each of the 14 subdivisions within the Commonwealth, are available for review at DER's Topographic and Geologic Survey Bureau.

During 1977, three areas were being studied for inclusion into Pennsylvania Scenic Rivers System. They were Pine Creek from Ansonia to the West Branch of the Susquehanna River, the Lehigh River from the Francis E. Walter Dam to Jim Thorpe, and the Schuylkill River from Port Clinton to Fairmount Dam in Philadelphia. Intent of the Scenic Rivers legislation is to protect and enhance outstanding and unique natural, cultural, aesthetic, and recreational values of designated waterways.

The Commonwealth's air pollution control program received support from a State Supreme Court decision authorizing DER to close a Bethlehem Steel Corp. coke battery in Johnstown. Bethlehem Steel's appeal to the U.S. Supreme Court was refused in early April.

The State Environmental Hearing Board (EHB) discussed two Bethlehem Steel appeals concerning a State order to install emission control devices on six furnaces at the company's Steelton plant.

DER also asked the EHB to assess civil penalties against Wheeling-Pittsburgh Steel Corp. for continuous violations of the State requirement to desulfurize coke oven gas at the Monessen Works located in Westmoreland County.

DER negotiated a consent order and agreement with New Jersey Zinc Co., Palmerton, Carbon County, for the reduction of air pollution from 12 sources at the firm's smelting plant not covered by previous agreements.

In early January, United States Steel signed a 7-year agreement with Federal, State, and local environmental agencies that will require it to spend $600 million to eliminate air pollution from its Clairton Coke Works in Pittsburgh.

At St. Joe Minerals Corp. located at Monaca, construction began in early August on a $12.7 million commercial-size experimental plant for scrubbing sulfur dioxide from coal-fired powerplant stack gas using the Citrate Process developed by the Interior Department's Bureau of Mines. Originally the Citrate Process was developed by the Bureau in the late 1960's to help curb sulfur dioxide (SO_2) emissions from base metal smelters. Construction of the demonstration project will be completed in late 1978 followed by a 1-year period to test emissions.

The Allegheny County Health Department, located in Pittsburgh with jurisdiction to regulation air contaminants within the county, issued a permit to allow Jones &

Laughlin Steel Corp. to replace six obsolete open hearth furnaces at its Pittsburgh Works with two electric furnaces. This replacement will reduce particulate emissions from steelmaking processes by nearly 90%. The City of Philadelphia with its own monitoring and pollution control programs is the only other area in the State with jurisdiction to regulate emissions within its boundaries.

Electric.—A report by the Public Utility Commission predicts power generating capacities will jump 50% in the next 9 years. Power increase is based on utilities planned additions of 2,990 megawatts coal-fired capacity, 820 megawatts of oil-fired power, and 6,864 megawatts of nuclear capacity.

Of the 67 licensed nuclear reactors in the Nation today, 5 are located in Pennsylvania, generating 8% of the State's electrical needs. Six other nuclear plants are under construction. Pennsylvania has a tradition of being the leader in nuclear power with the first plant in the Nation built by the Atomic Energy Commission (AEC) and the Duquesne Light Co. at Shippingport in 1957. Another first occurred in July 1977 when the experimental light water breeder reactor became operational. The Shippingport power center has been shut down for 2 years for installation of the test core for the light water breeder reactor. Conversion costs were estimated in excess of $200 million.

REVIEW BY MINERAL COMMODITIES

MINERAL FUELS

Coal.—Pennsylvania's bituminous coal production totaled 84.6 million tons, a decrease of 1% compared with that of 1976. Surface mining operations accounted for 53.8% and underground operations, for 44.7% of the total bituminous production; auger and refuse production contributed the remaining 1.5%. Although production from surface mines increased 16% compared with that of 1976, underground production actually decreased 12.5% even though total number of deep-mine employees increased by 700 to 24,779. There were two less deep mines operating in 1977 than in 1976. This trend resulted in reduced productivity per employee for the underground sector.

The total number of strip employees increased 10% to 10,139 with nearly 17% more surface operations than in 1976. This trend may change with passage of Public Law 95-87 known as the "Surface Mining Control and Reclamation Act of 1977" which requires compliance with numerous environmental standards.

Anthracite production has been declining steadily since 1917 when over 100 million tons were produced. The 1977 production totaled 5.06 million tons, a decrease of more than 4% compared with 1976 production. Of the total 1977 production, 10% was from underground mines; 57%, from surface operations; and 33%, from washery and bank production. Leading anthracite-producing counties in declining order of production with percentage of total coal produced were Schuylkill, 52.7%; Luzerne, 23.8%; Northumberland, 14.6%; Carbon, 2.9%; Lackawanna, 2.8%; Sullivan, 1.0%; Columbia, 1.0%; and Bradford and Dauphin, 0.5%.

The improved safety trend in the anthracite field over the past years was reversed on March 1, 1977, when a sudden inundation occurred in the Kocher Coal Co., located near Tower City, Schuylkill County, claimed the lives of nine mine workers. Recovery operations were completed on March 31, followed by a Federal/State investigation as to the cause. In the interim, the Pennsylvania Commissioner of Deep Mine Safety issued a directive increasing the number and depth of test holes in underground mines approaching abandoned areas to eliminate further mine inundations.

In the bituminous region, a fire which began on February 7, 1977, at Bethlehem Steel Corp.'s Revloc Portal No. 32 was brought under control 2 months later after 120 million gallons of water were used to quell a smoldering fire. The fire was apparently started by a roof fall that caused a trolley wire to arc resulting in ignition of mine timbers and eventually the coal seam. Two of Bethlehem's adjacent mines, closed because of the fire, reopened in early April, and in May, Revloc Portal No. 32 resumed operations.

Another underground coal mine fire of major importance occurred in the anthracite region near the town of Centralia. Previously, a fly ash barrier was used to control an outcrop fire from spreading towards city residences. Efforts will again be directed to control the fire and protect surface property from possible effects of

subsidence and noxious gases.

Rain began to fall in the Johnstown area late Tuesday evening, July 19, 1977, and continued the following day creating a major disaster. The U.S. Geological Survey stated that streams in the Conemaugh River Valley flowed at rates that could be expected only once in 500 years. At the height of the storm, Stony Creek flowed at a rate of 41 billion gallons of water per day. The Little Conemaugh was gaged at 26 billion gallons per day, and the Laurel Run Dam collapsed releasing 110 million gallons of water causing excessive damage downstream. The Bethlehem Steel plant was closed due to high water and two of the company's coal mines were flooded and two other mines closed due to lack of electricity. Near Seward, the Conemaugh No. 1 and the Florence No. 2 underground coal mines owned by North American Coal were flooded and were expected to reopen at yearend. Pennsylvania Electric Co.'s 137,000-kilowatt plant in Seward was damaged by the flood and didn't reopen until November 25. Pennsylvania Electric also reported 8,000 tons of stockpiled coal washed away by the floodwaters. A month after the flood, the death toll stood at 73. Seventeen others were unaccounted for, 160 people were hospitalized, 2,697 were injured or taken ill, and 4,600 people were homeless.

NONMETALS

Cement.—Portland cement shipments from 16 plants in 7 counties totaled 6.16 million tons valued at $196 million with an average value of $31.88 per ton. Compared with that of 1976, sales of portland cement increased 3% in quantity and 6% in value, with an increase of $0.96 per ton in unit value.

Masonry cement shipments from 14 plants in 8 counties totaled 410,714 tons valued at $19.9 million, with an average value of $48.52 per ton. Compared with that of 1976, sales of masonry cement increased 8% in quantity, 18% in value with an increase in unit value of $3.90 per ton.

Northampton and Lawrence Counties were the largest producers of both portland and masonry cements. Other producing counties in alphabetical order included Allegheny, Berks, Butler, Lehigh, Montgomery, and York. Of the 6,161,919 tons of portland cement sold, 11.6% was used by building material dealers; 22%, concrete product manufacturers; 58.1%, ready-mix companies; 5.8%, highway contractors; 1.6%, other contractors; and less than 1% for government agencies and miscellaneous customers.

Consumption of energy for the 17 producing plants was 404,136,000 cubic feet natural gas, 725,000 42-gallon barrels fuel oil, 1.24 million tons of bituminous coal, and 972,714,000 kilowatt-hours of electricity.

Major producers of portland and masonry cement were Amcord, Inc., Medusa Corp., National Gypsum Co., Penn-Dixie Cement Corp., and United States Steel Corp.

The cement companies are adopting new energy-saving techniques borrowed from the Europeans. The Coplay Cement Manufacturing Co., acquired in 1976 by Eurocem Inc., an American subsidiary of one of the largest French cement manufacturers, the Société des Ciments Francais, is building a $55 million plant at Nazareth with a 1.1-million-ton cement capacity per year. Replacing 11 smaller plants built years ago, the Coplay kilns are huge, measuring 17 feet in diameter with a length of 276 feet. Fuel savings will occur by using coal instead of natural gas or oil. The Nazareth plant has been designed around a four-stage preheater that will pour the crushed limestone, sand, and clay into the kiln at about 1,500° Fahrenheit reducing fuel requirements. Older kilns use 5.5 million Btu's per ton of cement compared with 2.9 million to 3.2 million Btu's per ton of cement in the newer facility.

Lehigh Portland Cement located in Allentown was acquired by Heidelberg Cement, Inc., an American subsidiary of Portland Zementwerke Heidelberg A.G. of West Germany, in October of 1977.

Clays.—During 1977, clay was produced at 67 operations in 23 of Pennsylvania's 67 counties. Production increased less than 1% in quantity, with an 18% decrease in value compared with that of 1976. Unit value per ton was $5.91 compared with $7.22 per ton in 1976.

Clearfield County with 13 operations was the leading clay producer with 309,622 short tons valued at $5,795,870 with a unit value of $18.72 per ton due mainly to a high production of fire clay. Other counties with a high production of clay and shale in order of decreasing production included Lawrence, Beaver, York, Bucks, Armstrong, and Jefferson Counties.

Leading producers in order of decreasing production included Glen-Gery Corp., Veon, Darlington Brick and Clay Products Co., Medusa Corp., Hanley Co., and Resco Products.

Clay was used mainly for common and face brick, fire brick, and portland and other cements. Other minor uses included flue linings, high-alumina refractory pottery, sewer pipe and drain, and quarry and structural tile.

Table 4.—Pennsylvania: Clays[1] sold or used by producers, by use

(Short tons)

Use	1976	1977
Common brick	192,506	249,749
Face brick	862,955	957,680
Firebrick, block and shapes	681,675	473,438
Flue linings	93,807	162,993
Lightweight aggregates	13,642	10,700
Mortar and cement, refractory	30,675	62,525
Portland and other cements	149,774	162,256
Sewer pipe	W	W
Drain, quarry, and structural tile	56,910	58,149
Other uses[2]	111,730	82,720
Exports: Mortar and cement and other refractories	97,812	84,180
Total	2,291,486	2,304,390

W Withheld to avoid disclosing company proprietary data; included with "Other uses."
[1]Excludes kaolin.
[2]Includes fertilizers (1976), flower pots (1976), pottery, roofing granules, terra cotta, and data indicated by symbol W

Gem Stones.—Collectors and dealers collected mineral specimens from several localities, refuse areas, and abandoned quarries throughout the State. The value of the material was estimated to be $10,000, nearly the same as that in 1976.

Graphite.—Two companies in Elk County and one company in Northampton County produced synthetic graphite. Principal uses for the synthetic graphite were for anodes, graphite shapes, crucibles and vessels, and electric motor brushes. Compared with that of 1976, production was 16% less in quantity but 8% more in value.

Gypsum.—One company in Philadelphia County calcined gypsum. Output increased 32%, but value decreased 21%, compared with that of 1976. Calcined gypsum was used mainly for prefabricated products such as regular wallboard, type X wallboard, and lath.

Iodine.—The Whitmoyer Laboratories Inc., Lebanon County, and West Agro Chemical Inc., Washington County, consumed crude iodine in the manufacture of calcium iodate, hydriodic acid, ethylenediamine dihydroidide, and iodofors, which are used in pharmaceuticals, catalysts, stabilizers, and sanitary uses. Iodine consumed was 4% less than that consumed in 1976.

Lime.—Ten plants operated by eight companies in eight counties produced 2 million tons valued at $72.6 million, 3% less in quantity but 6% greater in value than that in 1976. Nearly 84% of the total lime produced and 82% of the total value was attributed to the production of quicklime; hydrate lime accounted for the remaining 16% of the total production and 18% of the total value.

Centre County with three plants was the leading producer in the State with 33% of the total production and 31% of the total value. Other producing counties in alphabetical order were: Adams, Butler, Chester, Lebanon, Mifflin, Montgomery, and York.

The steel industry was the largest consumer of lime. Lesser amounts of lime were used for water purification, sewage treatment, agricultural purposes, and for other purposes.

Dravo Corp. announced in early May a 17-year contract valued at approximately $45 million to supply lime for sulfur dioxide removal at a third unit of the Bruce Mansfield powerplant in Shippingport. Previously, Dravo signed a 20-year contract valued at $200 million to supply lime for units one and two at the Shippingport facility. Other Dravo contracts to supply lime were with the Allegheny Power System Inc. and the Columbus and Southern Ohio Electric Co. Power companies used the lime to scrub sulfur dioxide from stack gases at coal-fired plants.

Table 5.—Pennsylvania: Lime sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1976		1977	
	Quantity	Value	Quantity	Value
Steel, BOF	1,034	32,937	980	34,971
Water purification	258	9,043	255	9,106
Steel, electric	151	4,662	164	5,845
Sewage treatment	94	3,092	120	4,300
Mason's lime	64	1,778	75	2,627
Steel, open-hearth	93	2,983	W	W
Paper and pulp	24	729	39	1,389
Agriculture	66	2,181	24	930
Acid mine water	27	966	W	W
Tanning	7	262	7	249
Petroleum refining	W	W	4	155
Soil stabilization	W	W	2	55
Other uses[1]	252	9,724	337	12,963
Total[2]	2,069	68,356	2,007	72,591

W Withheld to avoid disclosing company proprietary data; included with "Other uses."

[1]Includes refractory dolomite, open-hearth steel furnaces, other chemical uses, finishing lime, alkalies, explosives, sand-lime brick, ore concentration (1977), wire drawing, paint, petrochemicals (1977), sugar refining, coke (1977), glass (1977), other ore concentration (1976), other metallurgy (1976), and uses indicated by symbol W.

[2]Data may not add to totals shown because of independent rounding.

Mica.—Scrap and flake mica was produced by one company in Adams County. Compared with that of 1976, production and value of mica decreased. Mica was used in vacuum tube capacitors and various electrical and nonelectrical items.

Mullite.—One company produced high-temperature sintered mullite in Philadelphia County. Compared with 1976 figures, production increased 136% and value increased 110%. Mullite is a heat-resistant silicate of aluminum used in furnace linings.

Peat.—Peat production totaled 15,803 tons valued at $352,713 with a unit value of $22.32 per ton. Peat was produced by seven companies having eight operations in six counties. Three peat-producing operations were located in Luzerne County and one each in Erie, Lackawanna, Lawrence, Monroe, and Pike Counties.

Peat is a partially decomposed plant matter that has accumulated under water or in a water-saturated environment. Although peat is not classified as a coal, it is the initial stage in the formation of coal from vegetable materials. Virtually all peat is used for agricultural and horticultural purposes to improve the soil. Peat is classified as moss peat, reed-sedge, peat, and humus, according to the materials from which it has been formed and its degree of decomposition. Moss peat is a type that has been formed principally from sphagnum, hypnum, and/or other mosses; reed-sedge peat has originated mainly from reeds, sedges, and other swamp plants; and humus is peat too decomposed for identification of its geological origin.[2]

In Pennsylvania, moss peat comprised 6.3% of the total peat production; reed-sedge, 56.2%; and humus, the remaining 37.5%.

Perlite.—Crude perlite was shipped into the State and expanded at six plants by four companies in six counties. Quantity sold or used in 1977 totaled 34,916 tons with an average value per ton of $99.29 compared with 33,085 tons valued at $81.74 per ton in 1976. Principal uses for the product were for horticulture, construction aggregates, and formed products. Minor uses were for filter aid, low-temperature insulation, fillers, foundry uses, insulating board, castable insulation, and bonding mortars.

Sand and Gravel.—The total output of sand and gravel decreased slightly from 19 million tons in 1976 to 18.8 million tons in 1977. Construction sand and gravel accounted for 94% of the total production, and industrial sand and gravel production, the remaining 6%. Construction sand and gravel was used mainly for concrete aggregate and roadbase and coverings. Other lesser uses were for asphaltic concrete aggregates and other bituminous mixtures, and other uses. Of the 17,727 short tons of construction sand and gravel used, 86% was used for commercial purposes and 14% for government projects. The unit value of construction sand averaged $2.56 per ton and $2.46 per ton for construction gravel. Industrial sand and gravel was used mainly for glass manufacturing, molding, fire and furnace, and foundry uses. Unit price for industrial sand was $7.23 per short ton.

The number of sand and gravel deposits throughout the State totaled 135 of which 33 produced less than 25,000 tons each, 16

deposits produced between 25,000 to 50,000 tons each, 25 deposits produced between 50,000 and 100,000 tons each, and 36 deposits produced between 100,000 and 200,000 tons each. Only three deposits produced in excess of 1 million tons each. The remaining 22 deposits produced between 200,000 and 1 million tons each. Five of the deposits produced industrial sand and gravel and the remaining 130 deposits produced construction sand and gravel.

Sand and gravel was produced in 42 of the State's 67 counties. The leading county was Beaver with 11% of the State's total. Other leading counties in order of decreasing production were Erie, Armstrong, Bucks, and Huntingdon. Collectively, these five counties produced 46% of the State's total.

The leading producers of construction sand and gravel in alphabetical order were Davison Sand & Gravel Corp., Dravo Corp., Erie Sand Steamship Co., Glacial Sand and Gravel Co., and Warner Co.

Leading producers of industrial sand and gravel in alphabetical order were Penn Glass Sand, Medusa Corp., and McCready Inc.

Nearly 70% of the construction sand and gravel was shipped to market by truck; 19%, by water; and the remaining 11% was used at the plant site.

Of the industrial sand and gravel shipped to market, 69% was by truck and 21% by rail.

Table 6.—Pennsylvania: Sand and gravel sold or used, by county

(Thousand short tons and thousand dollars)

County	1976			1977		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
Allegheny	1	W	W	1	W	W
Armstrong	6	1,960	6,639	6	1,945	6,891
Beaver	4	994	3,088	5	2,144	5,028
Bedford	1	W	W	1	3	7
Berks	2	W	W	2	W	405
Blair	1	W	W	1	W	W
Bradford	4	W	W	4	W	W
Bucks	5	3,469	9,113	4	1,519	2,760
Butler	4	294	847	2	1	W
Cameron	1	W	W	1	W	W
Carbon	3	W	W	2	W	W
Clearfield	--	--	--	1	W	W
Clinton	--	--	--	1	W	W
Columbia	2	W	W	2	300	525
Crawford	6	505	1,228	7	763	1,549
Cumberland	2	W	W	3	262	753
Dauphin	1	W	W	1	W	W
Erie	14	1,954	4,024	15	2,077	4,528
Forest	2	W	W	2	W	W
Franklin	2	W	W	2	W	W
Fulton	1	W	W	1	W	W
Huntingdon	1	W	W	1	W	W
Lackawanna	1	W	W	1	100	175
Lancaster	2	W	W	2	W	W
Lawrence	9	809	2,079	9	727	1,934
Luzerne	5	630	1,549	5	900	2,238
Lycoming	1	W	W	1	W	W
Mercer	3	298	604	3	443	965
Mifflin	1	W	W	1	W	W
Monroe	5	364	970	5	440	860
Northampton	3	680	1,556	2	W	W
Northumberland	1	230	619	1	238	707
Pike	2	W	W	2	W	W
Schuylkill	1	74	319	1	74	299
Somerset	1	W	W	1	W	W
Tioga	6	307	529	5	410	577
Venango	8	587	1,232	8	509	1,137
Warren	11	435	1,027	14	608	1,365
Wayne	4	242	662	3	292	738
Westmoreland	1	W	W	1	W	W
Wyoming	2	W	W	2	W	W
York	3	W	W	3	W	W
Undistributed	--	5,204	19,529	--	5,091	19,137
Total[1]	133	19,038	55,611	135	18,846	52,578

W Withheld to avoid disclosing company proprietary data; included with "Undistributed."
[1]Data may not add to totals shown because of independent rounding

Table 7.—Pennsylvania: Sand and gravel sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1976		1977	
	Quantity	Value	Quantity	Value
Construction:				
Sand	9,669	24,886	8,899	22,808
Gravel	8,307	22,971	8,820	21,674
Total[1]	17,975	47,854	17,727	44,482
Industrial sand	1,063	7,757	1,120	8,095
Grand total[1]	19,038	55,611	18,846	52,578

[1]Data may not add to totals shown because of independent rounding.

Table 8.—Pennsylvania: Construction sand and gravel sold or used, by major use category

(Thousand short tons and thousand dollars)

Use	1976		1977	
	Quantity	Value	Quantity	Value
Concrete aggregate (residential, nonresidential, highways, bridges, dams, waterworks, airports, etc.)	7,940	21,366	6,291	16,242
Concrete products (cement blocks, bricks, pipe, etc.)	3,267	8,935	1,500	5,062
Asphaltic concrete aggregates and other bituminous mixtures	3,109	9,778	3,446	8,788
Roadbase and coverings	1,673	3,494	4,258	10,878
Fill	1,465	3,539	1,782	2,252
Railroad ballast	--	--	45	126
Other uses	522	745	405	1,135
Total[1]	17,975	47,854	17,727	44,482

[1]Data may not add to totals shown because of independent rounding.

Stone.—Among the States, Pennsylvania led in production of crushed sandstone, dimension slate, and crushed miscellaneous stone; ranked second in production of crushed stone and dimension sandstone; third in production of dimension miscellaneous stone; and fifth in output of crushed limestone.

Crushed stone was produced by 140 companies at 227 quarries for roadbase aggregate, roadstone, cement, and other uses. Output was about the same as in 1976, 63.5 million tons valued at $163.7 million. Leading producers were Koppers Co., Bethlehem Steel Corp., and New Enterprise Stone & Lime Co.

Dimension stone was produced by 29 companies at 28 quarries for rough construction, dressed flagging, cut stone, and other uses. Compared with that of 1976, output increased 1% to 65,880 short tons valued at $5.4 million. Leading producers of dimension stone were A. Dalley & Sons, Inc., Delaware Quarries, and Media Quarry Co.

The unit value of all stone increased 5 cents per short ton to $2.66 in 1977. Unit value of other types of crushed and broken stone were limestone, $2.60; granite, $4.39; sandstone, $2.87; traprock, $2.30; and other stone, $2.29 per ton. Unit value of all dimension stone increased $10.14 per ton to $81.39 per ton in 1977.

Lancaster County with 4.69 million tons of crushed and broken stone was the leading producer in the State, followed by Montgomery, Bucks, York, Berks, Northampton, and Adams Counties. Collectively, these seven counties produced 46% of the State's total crushed and broken stone.

Northampton County was the leading producer of dimension stone, producing 21,962 tons, followed by Chester, Bucks, and Delaware Counties. Collectively, these four counties produced 82% of the State's dimension stone.

Table 9.—Pennsylvania: Crushed stone[1] sold or used by producers, by use

(Thousand short tons and thousand dollars)

Use	1976		1977	
	Quantity	Value	Quantity	Value
Dense-graded roadbase stone	15,006	34,818	14,704	35,850
Roadstone	10,496	24,350	12,283	27,530
Cement manufacture	8,345	16,551	8,035	15,590
Bituminous aggregate	6,989	18,081	6,462	17,300
Concrete aggregate	6,905	15,236	6,358	16,600
Lime manufacture[2]	3,635	10,703	3,377	9,568
Surface treatment aggregate	3,700	8,196	2,784	6,875
Flux stone	2,778	9,278	2,306	8,026
Railroad ballast	1,306	3,430	1,630	4,646
Agricultural limestone	1,786	8,484	1,550	7,541
Macadam aggregate	1,114	2,418	1,389	3,175
Riprap and jetty stone	910	2,261	984	2,460
Filter stone	78	203	372	1,119
Terrazzo and exposed aggregate	W	W	157	598
Mine dusting	141	1,415	127	1,233
Asphalt filler	W	W	117	777
Other filler	92	1,304	102	1,463
Mineral food	W	W	58	W
Refractory stone	54	623	40	436
Building products	95	223	30	W
Acid neutralization	24	W	9	W
Other uses[3]	986	3,679	647	2,865
Total[4]	63,542	161,250	63,522	163,652

W Withheld to avoid disclosing company proprietary data; included with "Other uses."

[1]Includes limestone, sandstone, miscellaneous stone, traprock, and granite

[2]Includes dead-burned dolomite.

[3]Includes stone used in glass manufacture, abrasives, whiting, waste material, fill, sulfur dioxide (1976), unspecified uses, and uses indicated by symbol W

[4]Data may not add to totals shown because of independent rounding

Table 10.—Pennsylvania: Dimension stone[1] sold or used by producers, by use

Use	1976			1977		
	Short tons	Cubic feet (thousands)	Value (thousands)	Short tons	Cubic feet (thousands)	Value (thousands)
Irregular-shaped stone	15,960	201	$332	18,790	241	$373
Cut stone	10,810	138	387	W	W	W
Dressed flagging	11,160	47	542	10,704	124	569
Roofing slate	5,390	68	934	4,856	53	912
Structural and sanitary purposes	4,786	60	1,191	4,520	50	1,633
Rough monumental	W	W	W	3,583	43	439
Billiard tables	1,772	22	405	2,090	23	451
Rubble	2,519	32	31	1,749	22	19
Flooring slate	W	W	W	1,565	17	197
Rough flagging	1,946	25	55	1,494	19	48
Blackboards	193	2	100	134	1	107
House stone veneer	140	2	4			
Other uses[2]	10,430	183	657	16,394	201	614
Total[3]	65,112	780	4,639	65,879	794	5,362

W Withheld to avoid disclosing company proprietary data; included with "Other uses."

[1]Includes sandstone, slate, granite, and miscellaneous stone.

[2]Includes stone used in dressed construction, slate for electrical fixtures, curbing stone (1976), unspecified uses, and uses indicated by symbol W.

[3]Data may not add to totals shown because of independent rounding.

Sulfur.—Three petroleum refineries operated by three companies in Delaware and Philadelphia Counties plus one steel company in Allegheny County produced 82,000 tons of sulfur and sold or used 81,000 tons of sulfur in 1977. Compared with that of 1976, sulfur sold or used decreased nearly 11% in output and value.

Tripoli (Natural Abrasives).—Crude tripoli was mined by Keystone Filler & Manufacturing Co., Northumberland County. Compared with that of 1976, the tonnage sold or used was nearly 43% greater in quantity and 40% greater in value. Tripoli was used mainly for abrasive purposes.

Vermiculite.—Crude vermiculite shipped into the State was exfoliated by three companies: J. P. Austin Associates, Inc., Hyzer & Lewellen, and the W. R. Grace & Co., located in Allegheny, Bucks, and Lawrence Counties, respectively. The total quantity sold or used by producers was 45% greater and 51% more in value compared with that of 1976. Major uses in the building industry were for lightweight concrete aggregate, loose fill insulation, and other purposes.

METALS

Beryllium.—Kawecki-Berylco Industries, Inc., Reading, announced an increase in price of vacuum-grade ferro and nickel columbium master alloys by 13%. The new price will be $13.45 per pound and $16.47 per pound, respectively. The alloys are used to make high-strength nickel and cobalt-based alloys primarily in jet engines. Beryllium copper master alloy also increased in price to $62 per pound of contained beryllium from $59. The company produced specialty metals and chemicals.

Cadmium.—Pennsylvania ranked first among the States in smelter production of cadmium. Production of cadmium in the State increased 27% in quantity and 22% in value compared with that of 1976. Cadmium was used for electroplating parts of appliances, motor vehicles, and machinery, and was produced from smelting of zinc ores.

Copper.—Pennsylvania had a minimal production of copper during 1977. Copper was obtained as a byproduct from processing of other mined minerals.

Iron Ore.—Bethlehem Steel Corp. produced iron ore at its Grace underground mine located in Berks County. Production was reduced 46% compared with that of 1976 because of permanent closure of the underground mining operation on July 30, affecting 850 employees.

The Grace mine was the last iron ore mine operating in the State and with its closure, Pennsylvania steel mills must rely on imports of iron ore from other States or from foreign countries.

Iron Oxide Pigments.—Production occurred in five counties by six companies. United States Steel Corp. produced iron oxide from steel plant dust in Allegheny County. Both Pfizer Inc. and Reichard-Coulston, Inc., located in Northampton County produced natural and synthetic pigments. Other counties in which production occurred included Carbon, Chester, and Montgomery Counties. Production totaled 48,518 short tons valued at $21.2 million compared with 46,584 short tons valued at $17.4 million in 1976. Iron oxide pigments were used in paints, rubber, plastics, concrete products, paper, magnetic ink, fertilizers, and animal food.

Iron and Steel.—Shipments of Pennsylvania pig iron in 1977 totaled 17.3 million tons valued at $3,104 million, a decrease of 4% in total shipments and a 2% decrease in value compared with that of 1976. Types of pig iron produced were basic, bessemer, malleable, and direct castings.

At the beginning of 1977, steel production for the year was estimated at 103 million tons, an increase of 14% over the 1976 total, but in late September, steel companies were feeling the effects of steel imports from foreign countries.

United States Steel filed a petition with the U.S. Treasury Department asking for protection guaranteed by the Anti-Dumping Act of 1921. The petition indicated 20 million tons of foreign steel entering the United States representing 20% of domestic steel consumption. Also filing anti-dumping complaints with the U.S. Treasury Department were Armco Steel Corp., Bethlehem Steel Corp., American Spring Wire Corp., CF&I Steel Corp., and Florida Wire and Cable Co.

In late November, the Pennsylvania Governor met with Washington officials to ease the burden of foreign steel imports, and in early December, a new plan was adopted which would help the steel industry. The plan would have a reference price system setting steel imports within 5% of the full cost of production of the most efficient steel producer in the world plus transportation costs. Selling steel in excess of the reference price would result in appropriate Federal remedies. This plan was expected to reduce imports to 14% of the

U.S. market resulting in employment increases by nearly 25,000.

To help the steel industry, Conrail planned to purchase domestic steel rails in preference to foreign rails. Bethlehem Steel Corp., a Conrail supplier, indicated this decision would help the company's Steelton plant located in Dauphin County.

United States Steel continued to investigate the 4,000-acre Conneaut Lake site for a new steel mill. The property is located on the border between Pennsylvania and Ohio and is expected to produce between 3 million to 4 million tons of steel by 1982. An environmental impact study is currently being conducted at the site by Arthur D. Little Inc., a Massachusetts-based consulting firm.

United States Steel also announced installation of environmental equipment at several of its plants near Pittsburgh. A $125 million project was started on boilers at the Homestead, Irvin, Duquesne, Edgar Thomson, and Clairton plants. Fourteen projects for water quality were also underway and a $22 million desulfurization plant at the Clairton works was started. At the Edgar Thomson and Duquesne plants, dust collection systems were installed. Also included in the 1977 expenditures for area plants were rehabilitation of a coke oven battery at Clairton costing $13 million, improvements to a blast furnace at Edgar Thomson costing $26 million, and installation of a new cooler for the hot strip mill at the Irvin Works costing $5 million.

United States Steel, Republic Steel Corp., and Federal and State agencies also agreed on a plan to reduce water pollution along the Mahoning River which flows into the Beaver River in western Pennsylvania.

Bethlehem Steel Corp., located in Johnstown, announced reductions in employment totaling 3,900 workers due to heavy damage of the plant caused by the July 20 flood. To eliminate further reduction in the work force, the company requested permission from State and Federal environmental agencies to delay expenditures for additional environmental controls; however, Bethlehem planned to spend $7 million for air and water pollution control equipment over the next 2 years.

In late June, Bethlehem announced a new type of coal-carrying rail cars called the coal porter to be built at the Johnstown plant with a capacity of 100 tons each. The design of the coal porter gives the car an extremely low center of gravity, additional capacity, and a more stable ride.

Jones & Laughlin Steel Corp.'s (J&L) $140 million capital improvement program at the Aliquippa steel facility covers additional air pollution controls on two existing batteries of coke ovens and the subsequent replacement of those batteries, air pollution controls on the sinter plant, removal of sulfur from coke oven gas, and a new boiler in the central powerplant. These programs are estimated to reduce particulate emissions from the Aliquippa plant by 78% and sulfur emissions by 87% by 1981.

At yearend, J&L and Youngstown Steel were planning to merge. Youngstown is owned by Lykes Corp. of New Orleans and J&L by LTV Corp. of Dallas, Tex. The combination of J&L and Youngstown, which are respectively the Nation's seventh and eighth largest steelmakers, would create a producer the size of National Steel Corp., the Country's third largest, behind United States Steel and Bethlehem.

Alan Wood Steel Co., located in Conshohocken near Philadelphia, filed a petition for arrangements under Chapter 11 of the Federal Bankruptcy Act on June 11, 1977, and officially closed the steel plant on September 15. The firm's main product was construction-oriented steel plates which was affected mainly by foreign imports. Lukens Steel Co., located in Coatesville, also reported effects of foreign steel imports resulting in reduction of work force.

Wheeling Pittsburgh Steel Corp., located at Monessen, Westmoreland County, planned to construct a rail mill if a $70 million financial arrangement is completed. Under the $70 million agreement, the State would guarantee $10 million; Federal Economic Development Administration, $40 million; and Farmers Home Administration, $20 million.

Babcock and Wilcox Co., one of the Nation's largest producers of coal-fired and nuclear powerplants, is completing a $60 million plant in Ambridge, producing specialty steel tubes for utility, oil, and other markets.

Allegheny Ludlum Steel Corp. plant located at Brackenridge began operating a new $18 million argon oxygen decarburization vessel designed to increase stainless steel capacity by more than 35%. The 100-ton-capacity vessel is the first step in a $31 million expansion project that also calls for completion of a continuous casting process by early 1981.

Ellwood Steel Casting Corp., located in Ellwood City, opened a new facility using latest technology in foundry operations. Previously installed were three high-frequency 2,000-pound induction furnaces and chemical analyses system of furnace charges.

Howmet Aluminum Corp., owned by Pechiney Ugine Kuhlmann Corp., one of Europe's largest aluminum and chemical producers, plans to spend $20 million to build a casting facility and a new reversing mill in Lancaster.

Gulf Oil Corp. acquired Kewanec Industries Inc. of Bryn Mawr, a producer of oil and gas, chemicals, and coal interests. Gulf, located in Pittsburgh, is the Nation's seventh largest industrial company producing petroleum and various minerals.

Slag-Iron and Steel.—Production of iron slag totaled 5,314,074 tons valued at $17.3 million and production of steel slag totaled 1,048,311 tons valued at $2.27 million. Total slag produced equaled 6.4 million tons valued at $19.6 million in 1977.

Iron slag consisted of air-cooled, expanded, and granulated slag. Major use of air-cooled slag was for asphaltic concrete aggregate, roadbase and shoulders, and for concrete aggregate. Expanded slag was used for concrete products, and granulated slag for roadbase and shoulders, fill, and cement manufacture. Steel slag uses were mainly for roadbase and shoulders, fill, and asphaltic concrete aggregate.

Compared with other States, Pennsylvania produced approximately 20% of the national total.

Zinc.—Pennsylvania ranked seventh among the States in the production of zinc, producing 22,825 tons valued at $15.7 million with a unit price of $688 per ton. Compared with that of 1977, production increased 2%, but value decreased nearly 5%. Zinc was used mainly for galvanizing, brass and bronze products, castings, and rolled zinc. Significant quantities of zinc were consumed as pigments or other chemicals.

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[1]State Liaison Officer, Bureau of Mines, Harrisburg, Pa.
[2]Mickelson, D. P. Peat. Ch. in Mineral Facts and Problems. U.S. BuMines Bull. 667, 1975, p. 771.

Table 11.—Pennsylvania: Iron and steel slag sold or used in 1977, by use

Use	Iron blast-furnace slag								Steel slag		Total slag	
	Air-cooled		Expanded		Granulated		Total					
	Quantity (short tons)	Value f.o.b. plant	Quantity (short tons)	Value f.o.b. plant	Quantity (short tons)	Value f.o.b. plant	Quantity (short tons)	Value f.o.b. plant	Quantity (short tons)	Value f.o.b. plant	Quantity (short tons)	Value f.o.b. plant
Concrete aggregate	819,333	$2,707,549					819,333	$2,707,549			819,333	$2,707,549
Concrete products	418,676	1,411,550	W	W			661,647	2,435,687			661,647	2,435,687
Cement manufacture	100,000	320,000			38,540	$101,834	138,540	421,834			138,540	421,834
Asphaltic concrete aggregate	1,067,590	3,464,128					1,067,590	3,464,128	175,000	$393,750	1,242,590	3,857,878
Roadbase and shoulders	981,970	2,969,133			372,087	915,507	1,354,057	3,884,640	495,436	1,139,820	1,849,493	5,024,460
Fill	514,059	1,485,079			134,629	379,676	648,688	1,864,755	263,096	459,261	911,784	2,324,016
Railroad ballast	187,000	602,960					187,000	602,960	30,000	52,200	217,000	655,160
Mineral wool	20,620	60,512					20,620	60,512			20,620	60,512
Roofing, built-up and shingles	71,167	240,438					71,167	240,438			71,167	240,438
Soil conditioning					5,000	13,250	5,000	13,250			5,000	13,250
Glass manufacture	120,000	1,020,000					120,000	1,020,000			120,000	1,020,000
Fire protection									15,000	34,500	15,000	34,500
Ice control	27,152	75,920					27,152	75,920			27,152	75,920
Other uses	153,280	426,528			40,000	107,000	193,280	533,528	69,779	195,112	263,059	728,640
Total	4,480,847	14,783,797	W	W	590,256	1,517,267	5,314,074	17,325,201	1,048,311	2,274,643	6,362,385	19,599,844

W Withheld to avoid disclosing company proprietary data.

Table 12.—Principal producers

Commodity and company	Address	Type of activity	County
Abrasives: Satellite Alloy Corp	98 McKnight Rd. Pittsburgh, PA 15237	Plant	Allegheny.
Cement:			
Amcord, Inc.[1]	610 Newport Center Dr Newport Beach, CA 92660	do	Northampton.
Coplay Cement Manufacturing Co.[1]	Nazareth, PA 18064	do	Lehigh and Northampton.
Keystone Portland Cement Co.[1]	Box 1785 Allentown, PA 18105	do	Northampton.
Louisville Cement Co	501 South 2nd St. Louisville, KY 40202	do	Lawrence.
Medusa Corp.[1 2]	Box 5668 Cleveland, OH 44101	do	Lawrence and York.
Penn-Dixie Industries, Inc.[1 2]	60 East 42nd St. New York, NY 10017	do	Butler and Northampton.
United States Steel Corp.[1 3]	600 Grant St. Pittsburgh, PA 15230	do	Allegheny and Northampton.
Clays:			
Dresser Industries, Inc	Box 6504 Houston, TX 77005	Pit	Clearfield and Somerset.
Glen-Gery Corp	227 North 5th St. Reading, PA 19601	Pit	Adams, Berks, Northumberland, Union, York.
Hanley Co	28 Kennedy St. Bradford, PA 16701	Pit	Jefferson and McKean.
Resco Products	Box 108 Morristown, PA 19404	Pit	Clearfield and Huntingdon.
Coal, anthracite:			
Greenwood Stripping Corp	1 Venice St. Nesquehoning, PA 18240	Strip mine	Carbon and Schuylkill.
Jeddo-Highland Coal Co	800 Exeter Ave. West Pittston, PA 18643	Strip mine and culm bank.	Luzerne.
Leon East Kocher Coal Co	Box 127 Valley View, PA 17983	Underground mine.	Schuylkill.
Reading Anthracite Co	200 Mahantongo St. Pottsville, PA 17901	Culm bank and strip mine.	Northumberland and Schuylkill.
Coal, bituminous:			
Barnes & Tucker Co	357 Lancaster Ave. Haverford, PA 19041	Underground mine.	Cambria.
Bethlehem Mines Corp.[4 5]	701 East 3rd St. Bethlehem, PA 18016	do	Cambria and Washington.
C&K Coal Co	Box 69 Clarion, PA 16214	do	Greene.
Pittsburg & Midway Coal Co	Tenmain Center Kansas City, MO 64105	do	Washington.
Graphite, synthetic:			
Air Reduction Co., Inc	Theresia St. St. Marys, PA 15857	Plant	Elk.
Charles Pfizer & Co. Inc.[5]	235 East 42nd St. New York, NY 10017	do	Northampton.
Stackpole Carbon Co	St. Marys, PA 15857	do	Elk.
Gypsum, calcined United States Gypsum Co[6]	101 South Wacker Dr. Chicago, IL 60606	do	Philadelphia.
Iron oxide pigments:			
The Prince Manufacturing Co	Bowmanstown, PA 18030	do	Carbon.
Reichard-Coulston, Inc	15 East 26th St. New York, NY 10010	do	Northampton.
Lime:			
The J. E. Baker Co.[1]	Box 1189 York, PA 17405	do	York.
Mercer Lime & Stone Co	1640 Oliver Bldg. Pittsburgh, PA 15222	do	Butler.
National Gypsum Co.[1 2 7]	325 Delaware Ave. Buffalo, NY 14202	do	Centre.
Peat:			
Gouldsboro-Wayne Peat Co	Box 68 Gouldsboro, PA 18424	Moss	Wayne.
Lake Benton Peat Moss	1418 North Main St. Scranton, PA 18508	Bog	Lackawanna.
Perlite, expanded:			
Armstrong Cork Co	Lancaster, PA 17603	Plant	Lancaster.
Atlantic Perlite	Box 345 Primrose, PA 19018	do	Delaware.
Pennsylvania Perlite Corp	Box 2002 Lehigh Valley, PA 18001	do	Lehigh and York.
Perlite Manufacturing Co	Box 478 Carnegie, PA 15106	do	Allegheny.

See footnotes at end of table.

Table 12.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Sand and gravel:			
Davison Sand and Gravel Co	34th Ave. & 4th St. New Kensington, PA 15068	Dredge	Westmoreland.
Dravo Corp	One Oliver Plaza Pittsburgh, PA 15222	do	Beaver
Erie Sand Steamship Co	Erie, PA 16500	do	Lycoming.
Shippingport Sand & Gravel Co	1200 Slambaugh Bldg. Youngstown, OH 44501	Pit	Armstrong.
Warner Co.[1 4]	1721 Arch St. Philadelphia, PA 19103	Pit	Bucks.
Stone:			
G & West H Corson, Inc.[4]	Plymouth Meeting, PA 19462	Quarry	Montgomery.
The General Crushed Stone Co	712 Drake Bldg. Easton, PA 18042	do	Bucks, Chester, Delaware, Lancaster, Luzerne, Perry
Glasgow Quarry, Inc	Route 2, Box 121 Glasgow, MO 65254	do	Montgomery.
Martin Marietta Corp	11300 Rockville Pike Rockville, MD 20852	do	Centre, Chester, Fayette, Northampton.
New Enterprise Stone & Lime	New Enterprise, PA 16664	do	Bedford, Blair, Cumberland, Franklin, Huntingdon, Somerset.
Sulfur:			
Atlantic Richfield Co	3144 Passyunk Ave. Philadelphia, PA 19145	Plant	Philadelphia
British Petroleum Corp., Ltd	Box 428 Marcus Hook, PA 19061	do	Delaware.
Gulf Oil Corp	Box 7408 Philadelphia, PA 19101	do	Philadelphia.
Sun Oil Co	1608 Walnut St. Philadelphia, PA 19103	do	Delaware.
Tripoli: Keystone Filler & Manufacturing Co.	Muncy, PA 17756	Pit	Northumberland
Vermiculite, exfoliated:			
Hyzer & Lewellen	Box 155 Southampton, PA 18966	Plant	Bucks.
W. R. Grace & Co	62 Whittemore Ave. Cambridge, MA 02140	do	Lawrence.

[1]Also stone.
[2]Also clays.
[3]Also coal.
[4]Also lime.
[5]Also iron ore.
[6]Also expanded perlite.
[7]Also cement.

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